



Original communication

Frequency of signs of excited delirium syndrome in subjects undergoing police use of force: Descriptive evaluation of a prospective, consecutive cohort

Christine Alison Hall MD, Emergency Department Physician^{a,b,*}, Adam Shereef Kader B.Sc, Analyst^b, Anne Marie Danielle McHale B.Com, Medical Student^b, Lauren Stewart B.Sc (Hons), Analyst^b, Gordon Hilton Fick PhD, Professor of Biostatistics^a, Gary Michael Vilke MD, Emergency Department Physician^c

^a Faculty of Medicine, Department of Community Health Sciences, University of Calgary, Calgary, Alberta, Canada

^b Faculty of Medicine, Department of Emergency Medicine, University of British Columbia and Vancouver Island Health Research, Victoria, BC, Canada

^c University of California, San Diego Medical Center, Department of Emergency Medicine San Diego, California, USA

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ABSTRACT

There has, to date, been no prospective description of the frequency with which police officers encounter individuals who display signs of excited delirium syndrome (ExDS). The ability to document the relationship between signs of excited delirium and subject outcomes and then determine the underlying pathophysiology that results in morbidity and mortality is necessary in order to determine the case definition for ExDS in live individuals. We prospectively evaluated the frequency of signs of ExDS in a cohort of consecutive subjects undergoing use of force by law enforcement officers (LEOs) and determined the frequency with which those features were encountered alone and in combination. Data were collected prospectively for all subjects undergoing use of force (UOF) by LEOs in a single police agency from August 2006 until August 2009. Ten previously published signs of ExDS were prospectively recorded by officers: pain tolerance, constant/near constant physical activity, not responding to police presence, superhuman strength, rapid breathing, not tiring despite heavy physical exertion, naked/inappropriately clothed, sweating profusely, hot to the touch, and attraction to/destruction of glass/reflective surfaces. UOF occurred in 1269 of 1.56 million police–public interactions (0.08%, 95% CI 0.08, 0.086). Of subjects undergoing police use of force, 1101/1269 or 86.8% (95% CI 84.8%, 88.6%) were assessed as having effects of emotional disturbance, drugs, alcohol or a combination of these comorbidities at the scene at the time of the UOF and 837/1269 or 66% (95% CI 63.3, 68.6) were violent at the time of the UOF. Excluding violence, 655/1269 (51.6% 95% CI 48.8, 54.4) had no signs of ExDS at the time of UOF and another 405/1269 (31.9% 95% CI 29.4, 34.6%) had only one or two signs of ExDS at the time of UOF. The remaining 209/1269 (16.5%, 95% CI 14.5, 18.6) had 3 or more concomitant signs of ExDS at the time of UOF. One person died in our cohort who was experiencing 10 concomitant features of ExDS at the time of the UOF event. With only one death in our 3 year prospective cohort, we cannot comment on causality or correlation between number of Excited Delirium signs and mortality. Further study must be undertaken to determine whether correlation exists between higher numbers of ExDS signs and physiologic measures of acute underlying pathology in live subjects.

Conclusions: Law enforcement officers and other prehospital care providers can recognize and describe symptoms of ExDS in the field at the time of interaction. Even though police use of force is rare over 15%, or approximately 1 in 6, of individuals undergoing police UoF have 3 or more concomitant signs of Excited Delirium at the time of the UoF event. The single death in our cohort occurred in an individual with 10 concomitant signs of ExDS. Future work including further clinical outcome data will determine whether higher numbers of concomitant signs of ExDS predicts subject morbidity or mortality and whether any specific symptoms or symptom cluster is associated with death. If so, a case definition will be able to be fully described.

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* Corresponding author. KW1 1952 Bay Street, Royal Jubilee Hospital, Victoria, British Columbia V8R 1J8, Canada. Tel.: +1 250 370 8111x3573; fax: +1 250 370 8106.
E-mail address: christinehallmd@gmail.com (C.A. Hall).

1. Introduction

Excited delirium syndrome (ExDS) has been defined by DeMaio as “combative and/or violent behavior” associated with delirium which is, “an acute (minutes to hours), transient disturbance in consciousness and cognition; disorganized and inconsistent thought processes; inability to distinguish reality from hallucinations; disturbances in speech; disorientation to time and place; misidentification of individuals.”¹ The majority of the medical literature on the topic of excited delirium syndrome comes from forensic scientists and medical examiner offices, reviewing post-mortem presentations.^{2–6} There are a number of other cohort reviews and case series that try to define presenting features/characteristics of ExDS but are limited by the retrospective review process that relies on spontaneous documentation of non-standardized information.^{7–9} That methodology enables some evaluation of reported clinical characteristics of ExDS but recording bias precludes the ability to accurately determine what proportion of subjects encountered by police officers can be anticipated to have signs of ExDS at the time of the police public interaction. Recently, the American College of Emergency Physicians (ACEP) convened a task force to better review this topic and their findings were published confirming that ACEP has joined the National Association of Medical Examiners (NAME) in recognizing ExDS as a diagnostic entity.¹⁰ However, there is not a succinct case definition of excited delirium syndrome at the present time, in part because there has not been prospective documentation of the frequency with which features occur alone and in combination in the diverse cohort of individuals who interact with police. Additionally, failure to describe the clinical features of Excited Delirium Syndrome in live individuals means that clinical measures of underlying pathophysiology have not been evaluated in specific groups of individuals demonstrating signs of excited delirium syndrome prior to death. It is unknown whether there are specific clinical features that can define the tipping point between the simple presence of psychomotor agitation vs. the profound agitation and concomitant metabolic compromise of excited delirium that ends in a sudden and unanticipated death. It is unknown whether any specific symptoms or symptom clusters clearly predict morbidity or mortality for persons who display ExDS characteristics. Defining the frequency with which signs of ExDS are found in live individuals prior to death is the first step in determining a case definition for ExDS, in determining the group in whom physiologic assessment should be undertaken, in directing targeted interventions and in identifying the risk of death for persons with signs of ExDS.

We sought to prospectively describe the characteristics of subjects who undergo police use of force, to evaluate the frequency with which signs of ExDS were present alone and in combination in subjects undergoing use of force by police officers, and to determine the frequency of death in a cohort of individuals displaying those signs.

2. Methods

This was a prospective, single police agency and multiple receiving center study in which all subjects who were encountered by law enforcement officers and had use of force applied to them were enrolled. Officers documented signs of excited delirium in these subjects prospectively by completing data fields that were buried within the in-car electronic use of force reporting documentation used by the agency. The clinical characteristics/signs that officers documented have been previously described as being suggestive of excited delirium syndrome and include: violent behavior, tolerance to pain, constant or near constant physical activity, subject not responding to police presence, superhuman

strength, rapid breathing, does not tire despite heavy physical exertion, naked or inappropriately clothed for the environment, sweating profusely, hot to the touch, and attraction to or destruction of glass or reflective surfaces.^{1,10–12} No specific training was given to officers regarding the definition of these clinical signs of excited delirium since each of these signs is a common sense, practical finding that is clinically obvious to even an untrained observer. For example, the variable “hot to the touch” was indicated present if the officer in contact with the subject perceived the subject’s skin as hot, it was not defined by a specific range of temperature. Signs of excited delirium were not mutually exclusive and officers could indicate any number of signs without restriction or could indicate that the subject displayed none of the features.

In addition officers recorded prospectively whether the subject, in the impression of police officers with information only available at the scene was suffering emotional distress, was intoxicated with drugs and/or was intoxicated with alcohol, was emotionally distressed and intoxicated with drugs and/or alcohol, or was demonstrating none of these comorbid conditions.

Patients were included if the officer implemented any use of force above the simple escortive behavior that is commonly referred to by police agencies as soft hands control. Thus, we defined the use of force as any of the following alone or in combination: use of physical stuns (application of a specifically targeted blow to a nerve plexus such as the peroneal nerve or the brachial plexus), physical strikes (kicks or open hand strikes) or physical takedown techniques (arm takedowns or leg sweeps), OC spray, baton and/or Conductive Energy Weapons (TASER X26) alone or in combination with any of the other force modalities, including firearms, described here. Every duty officer in the involved police service has access to a TASER and does not need to call for a supervisory oversight to use it. Special teams employ tactics such as Arwin, beanbag, and K9, however, special teams activities are not included in the general duty statistics of this study.

The agency that participated is a municipal service whose contract is to police the entire metropolitan area of a large Canadian city. The police service has 1979 operational sworn officers and provides all policing services to all areas of the city, thus all use of force events are included in the data from this agency. The city has a population of 1,182,446, covering an area of 726.5 km² (280.5 sq mi) of urban, suburban, rural and remote areas.

Human subjects’ committee approval was obtained at the relevant University Institutional Review Board (IRB). We are prohibited by privacy considerations imposed by the IRB from identifying the relevant university in publication because the naming of that university in this publication enables the public identification of the single study subject who died. Data were entered into a database (Access, Microsoft Corporation, Redmond, WA) with 20% of the data double entered and cross checked for accuracy. Descriptive analysis was performed and observed proportions were determined with standard methods. CIs were calculated using Stata® Version 10, Statacorp, Redmond, TX; with Yates’ continuity correction for small numbers where appropriate.

3. Results

Over the thirty-six month study period, 1269 use of force events occurred out of 1.56 million police public face-to-face interactions where officers were in the direct physical proximity of a member of the public; which determines that 0.08% (95% CI 0.08%, 0.086%) of all police public interactions included the use of force. In other words, in over 99.9% of police public interactions, no use of force above soft hands techniques occurred. This finding was stable across three years of study. Data was collected for all use of force events.

Table 1 demonstrates that the majority of individuals in whom police use force were male and had evidence of a comorbidity detected by police officers at the scene at the time of the event, defined as the officers prospective description of the subject being intoxicated, emotionally distressed or a combination of intoxicants and/or emotional distress. The vast majority of subjects were affected by one or more of these conditions according to prospective assessment by the officers at the scene. Overall, 307/1269 (24.2%, 95% CI 21.9%, 26.6%) subjects were assessed as suffering from emotional distress, of whom 78.8% were male. Only 116 (9% of the entire UoF cohort 95% CI 7.6, 10.9%) of those were described as having emotional distress without evidence of intoxication with one or more intoxicants. Overall, 985/1269 (77.6%; 95% CI 75.2%, 79.9%) subjects were assessed by officers as having consumed one or more intoxicants with or without concomitant mental distress.

Table 1 also indicates the total number and proportion of individuals in our cohort with each clinical ExDS feature documented prospectively by officers at the scene at the time of the use of force encounter. The majority, 66% of the total cohort, demonstrated violence or extreme aggression at the time of the use of force encounter. Since violent events are not anticipated to be unique to individuals in a state of excited delirium and two thirds of the cohort was described to be violent at the time of the interaction, including individuals with no features of excited delirium, we believe that the presence of violence will not serve as a potential discriminator between subjects suffering from Excited Delirium Syndrome and those who are not. Thus, further results and discussions of Excited Delirium Syndrome characteristics related to the ten remaining features of Excited Delirium, excluding violence.

Table 2 demonstrates the frequency with which each of the ten remaining signs of ExDS were encountered, beginning with individuals who displayed all 10 previously published features of ExDS at the time of the interaction, and continuing down to individuals with no features of ExDS. With violence excluded, over half of the cohort of subjects undergoing police use of force demonstrated no other signs of ExDS at the time of the interaction with police (**Table 2**). Another 405 (31.9%; [95% CI 29.4%, 34.6%]) had only one or two signs of ExDS. In the 1269 subjects undergoing police use of force, 209 subjects (16.5%; 95% CI [14.5%, 18.6%]) of the cohort had three or more signs of ExDS at the time of police UOF – approximately 1 in 6 use of force events.

Table 1
Demographics, comorbidities assessed at the time of use of force and documentation of clinical features of Excited Delirium Syndrome (ExDS) at the time of use of force in 1269 consecutive subjects.

	N	% Cohort (95% CI)
Age (mean)	31	IQR 22, 39
Male	1114	87.9 (85.9, 89.5)
Gender not recorded	2	
Comorbidities assessed at the scene	1101	86.8 (84.8, 88.6)
Emotionally Disturbed Person (EDP) only	116	9.1 (7.6, 10.9)
Alcohol only	505	39.8 (37.1, 42.5)
Drugs only	133	10.5 (8.8, 12.3)
Any combination of comorbidities	347	27.3 (24.9, 29.9)
No ExDS characteristics	282	22.2 (20, 24.6)
Violent behavior	837	66.0 (63.3, 68.6)
Pain tolerance	264	20.8 (18.6, 23.1)
Constant/near constant activity	313	24.7 (22.3, 27.1)
Not responsive to police presence	275	21.7 (19.4, 24.0)
Superhuman strength	137	10.8 (9.1, 12.6)
Rapid breathing	123	9.7 (8.1, 11.5)
Doesn't fatigue	112	8.8 (7.3, 10.5)
Naked/inappropriately clothed	94	7.4 (6.0, 9.0)
Sweating profusely	62	4.9 (3.8, 6.2)
Hot to touch	44	3.5 (2.5, 4.6)
Glass attraction/destruction	36	2.8 (2.0, 3.9)

Table 2

Combinations of 10 possible concomitant Excited Delirium Syndrome features in 1269 consecutive subjects in whom police used force. Note: violence excluded as a feature.

Number of concomitant features	n	% Cohort (95% CI)
10	3	0.2 (0.05, 0.7)
9	12	0.9 (0.5, 1.6)
8	6	0.5 (0.2, 1.0)
7	8	0.6 (0.3, 1.2)
6	8	0.6 (0.3, 1.2)
5	32	2.5 (1.7, 3.5)
4	47	3.7 (2.7, 4.9)
3	93	7.3 (5.9, 8.9)
2	138	10.9 (9.2, 12.7)
1	267	21.0 (18.8, 23.4)
0	655	51.6 (48.8, 54.4)

It should be noted that not all individuals with large numbers of concomitant clinical signs of ExDS had all the same signs. Cluster analysis was undertaken to determine whether a unifying cluster of core features was always present but it was not. Other than the predominance of violence (which was excluded) we did not find that individuals began with a core group of a few central standard features and then progressed stepwise through additional features until all of the known signs of ExDS were concomitant.

For the 1269 subjects in our study, we evaluated whether the presence of three or more concomitant signs of ExDS was associated with an increased odds of being assessed by officers to be under the influence of drugs and/or alcohol or to be suffering from emotional distress (**Table 3**). The odds of being assessed as being drug intoxicated or suffering from emotional distress were significantly higher for those individuals with 3 or more signs of Excited Delirium but individuals with 3 or more features of Excited Delirium were less likely to be assessed as alcohol intoxicated whether alcohol intoxication was thought to be alone or in combination with drugs and/or emotional disturbance.

Because of previous study documenting the presence of hyperthermia in the presence of dopamine transport dysregulation and in excited delirium syndrome ending in death, we were very interested in the frequency of tactile hyperthermia (variable: hot to the touch) in the cohort of individuals undergoing police use of force simply described as an officer's impression that the individual was hot to the touch. We found that a significantly larger proportion of individuals who were described as hot to the touch had 3 or more concomitant signs of ExDS as compared to individuals who were not described as hot to the touch by officers at the scene (**Table 4**). The difference in the proportion of individuals with three or more concomitant signs of ExDS is statistically significant at 66%, with a 95% confidence interval for the difference of between 53% and 71%, with Yates' continuity correction.

4. Discussion

We found that police use of force was a rare event involving predominantly male subjects who were assessed by officers as being in states of intoxication and/or emotional distress at the time of the police public interaction. Privacy restrictions prevented us

Table 3

Odds of assessed comorbidity if subject had 3 or more signs of Excited Delirium Syndrome.

Comorbidity assessed by officers as present alone or in combination	OR _{comorbidity if ≥3 signs ExDS}	95% CI
Any drug intoxication N = 394	5.64	(4.1, 7.7)
Any EDP N = 307	2.33	(1.76, 3.20)
Any alcohol intoxication N = 810	0.90	(0.66, 1.22)

Table 4
Presence of tactile hyperthermia.

	N	Number with ≥ 3 signs of ExDS	% With ≥ 3 signs of ExDS (95% CI)
Hot to the touch	44	42	95.5% (84.5, 99.4)
Not hot to the touch	570	167	29.3% (25.6, 33.2)

from collecting data on all police public interactions, thus, our study cannot document the frequency with which police public interactions include individuals in a state of intoxication or emotional distress but do not include the use of force. The predominance of intoxication(s) alone or in combination with emotional distress illustrates the great situational difficulties that exist when a police public interaction becomes a use of force event. Given the profile of subjects in whom police used force in our study, it is anticipated that the nature of the individuals and situations at play may significantly hamper the applicability of and anticipated success from verbal de-escalation techniques in some situations.

Further, we believe the finding that 99.92% of police public interactions did not involve a police use of force across three consecutive years of study is important in emphasizing the success that most officers have in interacting with most members of the public; a finding that does not cry out for widespread improved de-escalation training. These findings are consistent with those of other authors who document police use of force at 1% or less of police public interactions.¹³ Even with evidence of abnormally behaving subjects, there were only 1269 use of force incidents in over 1.5 million total police public interactions where a police officer and a member of the public were within physical proximity. We did not restrict our study to upper level uses of force, but rather began our data collection as soon as more than simple escortive techniques were used and we are confident that even relatively low levels of police use of force are reflected in our cohort.

Some will argue that sudden in custody death has occurred with force applications as simple as a pair of handcuffs, but since sudden in custody death has been documented primarily in agitated, incoherent and struggling individuals, we would raise the question of how those handcuffs came to be applied in an incoherent individual without at least some contact above simple “come along” techniques.^{1,14} These observations raise the importance of having a definition of use of force when comparing data within and between police agencies and in having police agencies record their use of force practices. Comparison data between police agencies will not be useful if the definition of levels of force and the parameters used to evaluate use of force are not similar or have not been described in enough detail to determine their comparability. We also believe that further study is required to document the number of individuals involved in interactions with police in which force is not used who are in a state of emotional distress and/or intoxication. Privacy restrictions prevented us from specifically evaluating this cohort of individuals in our study.

We anticipated that the syndrome of ExDS might be rare, and found that the majority of subjects with whom police used force had fewer than three concomitant clinical characteristics of ExDS. To limit recall bias for signs of ExDS, we included a checklist of previously documented clinical characteristics of ExDS within the normal use of force report for the police agency which is part of the in-car computer reporting system. The use of force report and the checklist within it was completed at the conclusion of the interaction and prior to the end of the shift by one officer for any use of force event as is the usual practice for the involved agency, thereby limiting recall bias and recording bias if two or more officers completed a report for the same event. Some may suggest that the

presence of a checklist generated positive recall bias, however, the vast majority of subjects had fewer than three features indicated and more than half of subjects undergoing police use of force had the checklist item “none of the above” indicated. Clearly, giving police officers a checklist of signs did not compel them to find the features present.

While the majority of our study subjects had few concomitant characteristics, we believe that, in keeping with previously published research on sudden in custody death, those rare subjects with many concomitant features of ExDS represent the high risk group in whom sudden in custody death occurs.^{1,14–17} The only subject who died in our study had all 10 features of ExDS concomitantly at the time of his interaction with police. Describing prevalence with which multiple concomitant features of excited delirium syndrome are encountered enables the next step, which is to link the observations of excited delirium features in the field to medical outcomes analysis and to complete physiologic investigation in individuals with higher numbers of signs of Excited Delirium to determine where, in live individuals, a case definition of excited delirium rests.

We found that within the group of individuals with three or more concomitant features, there is variation in the exact features in each individual. Cluster analysis proved fruitless in determining a specific central cluster of signs seen in all persons with higher numbers of signs of ExDS. We believe that this is because multiple underlying pathologies are at play in the generation of an agitated state in individuals with whom police interact.^{1,10,14,18} For example, even though the initial descriptions of excited delirium came from cases involving cocaine intoxication,¹⁹ in keeping with the medical literature, some of our cohort with higher numbers of ExDS signs were thought to have psychiatric distress alone.^{1,10,12,18,20}

In our study, subjects with multiple concomitant signs of ExDS were less likely to have known or suspected alcohol intoxication documented by police officers. This finding makes clinical sense since alcohol ingestion would serve as a psychomotor depressant for most individuals. However, it is unknown at what point stimulant drug ingestion would override the suppressive effects of alcohol, particularly in the case of cocaine combined with alcohol. Conversely, individuals with higher numbers of signs of ExDS were more likely to be assessed as having evidence of drug intoxication or emotional distress by the police officers at the scene. We cannot comment on whether the presence of high numbers of features led the officers to presume the individual was drug intoxicated or mentally ill or vice versa. However, of the three individuals in our cohort with all ten features of ExDS, one was described by officers as suffering from emotional distress alone, the other two were described as a combination of emotional distress and drug intoxication. Either way, it is clear that officers can recognize multiple features of ExDS in the field, and do not always attribute those features to drug intoxication alone. This is an important point in the education of police officers and other prehospital personnel. It is an error in judgement to assume that signs of Excited Delirium are only associated with illicit drug use and that individuals with agitation and delirium thus are best processed through legal venues. If interventions are to be made in mitigating death, the point in having police officers and other prehospital personnel recognize the presence of multiple features of ExDS is to expedite the transport of that individual for medical assessment and care. Immediate medical attention can only be optimized if ExDS signs are recognized and personnel are given the tools to do so.

The presence of tactile hyperthermia (being described as hot to the touch) emerged as an interesting characteristic that also gives credence to the presence of many concomitant features as being representative of an abnormal underlying physiologic process. People in our study who were described by officers as being hot

were significantly more likely to have three or more characteristics of ExDS than those who were not described as being hot. Anecdotal, in two individuals who the officers described as hot, case notes included spontaneous comments such as “he was a human blast furnace” and “I could tell he was hot from three feet away”. In our cohort, all 21 subjects who had 8 or more concomitant features were described as hot. Other researchers have examined the physiology through which excited delirium may become a fatal state and dysregulation of dopamine receptors with resultant uncoupled heat regulation has been discussed as a potential harbinger of death.^{21–24} Whether the presence of tactile hyperthermia predicts morbidity or mortality, and thus serves as a “tell” for police officers in anticipating imminent death remains to be seen. Even though the individual who died in our study was described as hot to the touch, the presence of a single unexpected death in three consecutive years of our study does not enable statistical evaluation of the association between this feature and death.

The individual who died suddenly during our prospective data collection displayed all 10 features of excited delirium concomitantly at the time of the police use of force. However, the presence of a single death in our study does not enable statistical evaluation of the number or nature of features of Excited Delirium as a predictor of death. We continue to collect data in order to further investigate this important question.

At this time, because of the rare occurrence of death in custody in our cohort, our study is limited to defining the incidence of Excited Delirium clinical characteristics in subjects who underwent police use of force, using a definition of use of force that begins at the lowest possible level of actual force application. Privacy restrictions prevented retrospective evaluation of police records for the presence of ExDS features in all individuals who were in contact with police for any reason during the study interval. There is little doubt that individuals with some features of ExDS interact with police and no force is used. However, because use of force defined the entry point for our study, we are unable to comment on the frequency of or outcomes for individuals with features of ExDS, emotional disturbance and/or intoxicated states in subjects who do not undergo police use of force.

Similarly, while there is little doubt among researchers and police agencies that some individuals who demonstrate ExDS symptoms find themselves repetitively the subjects of police interest, privacy laws prevented the collection of subject identifiers, thereby eliminating our ability to evaluate our data for repetitive contact with the same individual. It is anticipated that within this cohort, there are some individuals who are multiply represented. Even so, each time an individual interacts with police represents a new clinical situation with new clinical risks and as such even multiple presentations of the same individual add to the body of knowledge regarding the frequency with which police officers encounter the entity ExDS in the field. We hope to work with privacy protection regulations such that this variable can be evaluated in future.

Data for this study were collected by police officers at the scene at the time of their interaction with the subject of interest. Data recorded reflect the officers' impressions of the situation at the time of the event and do not rely on post hoc confirmation of the presence or absence of specific medical diagnoses or toxidromes. While it is enticing to request correlation of such findings with toxicology assessment made following the use of force event, the reality is that many subjects are not and need not be transported to hospital and those that are do not often have comprehensive toxicology assessments carried out. Thus, reliance on toxicology assessments to determine which subjects were and were not

intoxicated would result in significant measurement bias in allocating those descriptors. The results of our study and the categorizations within it are reflective of real world practice and the officers' assessment of comorbidity reflects the true street environment in which operational decisions are made. These decisions are and will continue to be based on information that is immediately available at the scene, based on the assessments of the personnel in contact with the individual without the ability to clarify or confirm, and without the luxury of time to make a detailed management decision based on information that cannot be gained until after the fact. The construction of decision making strategies or algorithms to manage individuals with proven intoxication in one manner and emotionally disturbed individuals with negative toxicologic screens in another would be completely arbitrary and useless on the street. Lastly, the immediate emergency treatment of the undifferentiated agitated and combative patient does not depend on a completed toxicologic assessment but is based in the use of broad spectrum sedating agents with the goal of gaining physical control of the individual in order to begin to manage the effects of sympathetic stimulation regardless of the underlying cause.^{25–28}

5. Conclusions

Law enforcement officers and other prehospital care providers can recognize and document signs/characteristics of ExDS in the field at the time of interaction. While police use of force is rare, over 15% of individuals undergoing police UoF (or 1 in 6) have 3 or more concomitant signs of Excited Delirium at the time of the UoF event. The single death in our cohort occurred in an individual with 10 concomitant signs of ExDS. Future work including further clinical outcome data will determine whether higher numbers of concomitant signs of ExDS predicts subject morbidity or mortality and whether any specific symptoms or symptom cluster is associated with death. If so, a case definition will be able to be fully described and directed interventions explored in an attempt to mitigate sudden in custody death.

Conflict of interest

Dr. Hall has served as a paid expert witness for inquests in Canada regarding sudden in custody death.

Dr. Vilke has served as a paid expert witness in the USA and in Australia/New Zealand for inquests surrounding sudden in custody death and has been a paid lecturer surrounding sudden in custody death issues in Canada and the USA.

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Ethical approval

Ethical approval for the completion of this study was gained through the institutional review board (science and ethics) for the relevant university. Since the university shares the same name as the city in which the study was conducted, it cannot be named to prevent identification of the identity of the subject who died through the reading of this publication.

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